

INORGANIC HYDROGEN AND HYDROGEN POLYMER COMPOUNDS AND  
APPLICATIONS THEREOF

ABSTRACT

- 5       Compounds are provided comprising at least one neutral, positive, or negative hydrogen species having a binding energy greater than its corresponding ordinary hydrogen species, or greater than any hydrogen species for which the corresponding ordinary hydrogen species is unstable or is not observed. Compounds comprise at least one increased
- 10 binding energy hydrogen species and at least one other atom, molecule, or ion other than an increased binding energy hydrogen species. One group of such compounds contains one or more increased binding energy hydrogen species selected from the group consisting of  $H_n$ ,  $H_n^-$ , and  $H_n^+$  where n is a positive integer, with the proviso that n is greater than 1
- 15 when H has a positive charge. Another group of such compounds may have the formula  $[MH_mM'X]_n$  wherein m and n are each an integer, M and M' are each an alkali or alkaline earth cation, X is a singly or doubly negative charged anion, and the hydrogen content  $H_m$  of the compound comprises at least one increased binding energy hydrogen species.
- 20 Applications of the compounds include use in batteries, fuel cells, cutting materials, light weight high strength structural materials and synthetic fibers, corrosion resistant coatings, heat resistant coatings, xerographic compounds, proton source, photoluminescent compounds, phosphors for lighting, ultraviolet and visible light source, photoconductors,
- 25 photovoltaics, chemiluminescent compounds, fluorescent compounds, optical coatings, optical filters, extreme ultraviolet laser media, fiber optic cables, magnets and magnetic computer storage media, superconductors, and etching agents, masking agents, agents to purify silicon, dopants in semiconductor fabrication, cathodes for thermionic generators, fuels,
- 30 explosives, and propellants. Increased binding energy hydrogen compounds are useful in chemical synthetic processing methods and refining methods. The increased binding energy hydrogen ion has application as the negative ion of the electrolyte of a high voltage electrolytic cell. The selectivity of increased binding energy hydrogen
- 35 species in forming bonds with specific isotopes provides a means to purify desired isotopes of elements.